

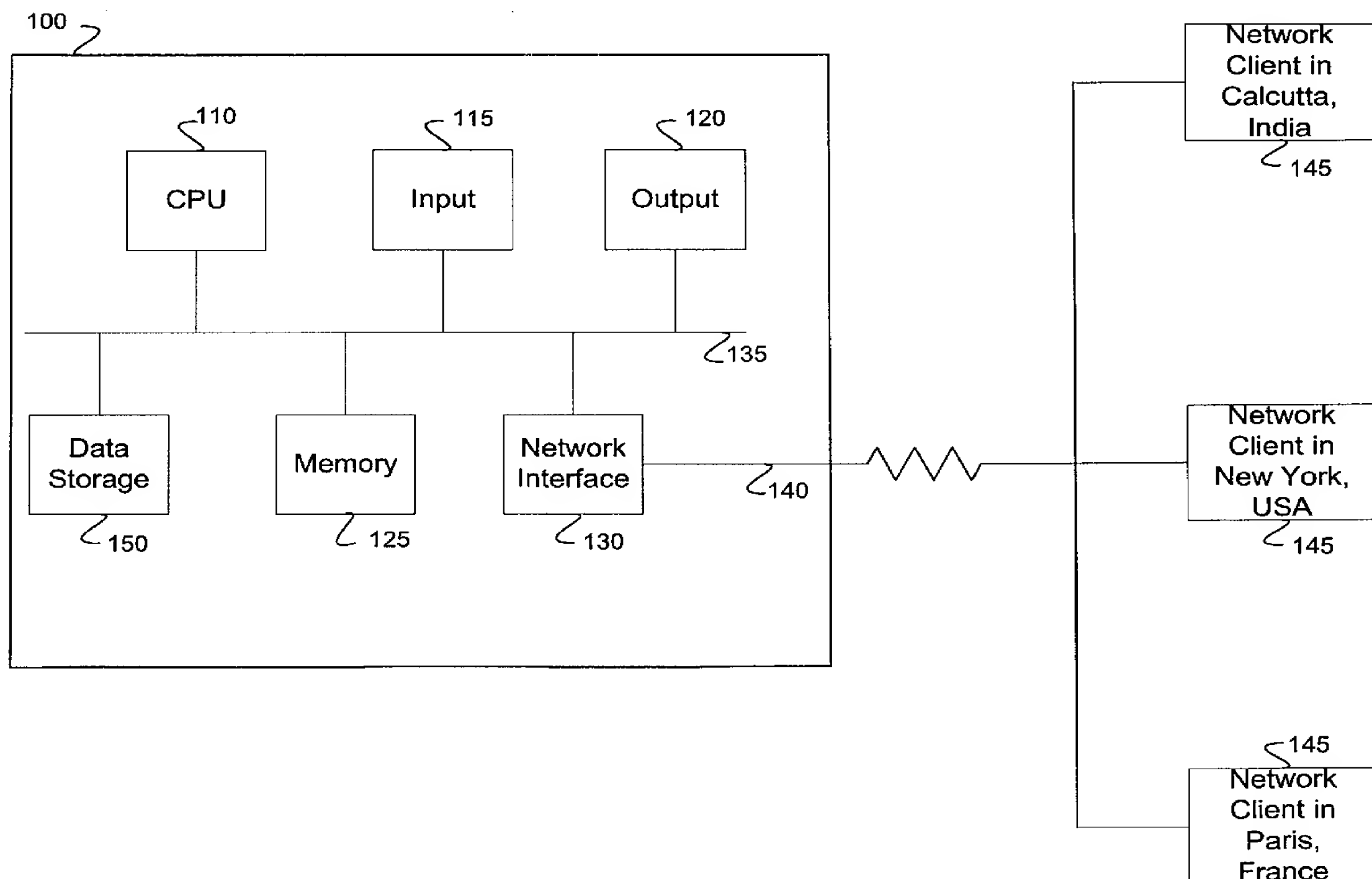


US 20010049697A1

(19) **United States**(12) **Patent Application Publication**
JOHNDREW et al.(10) **Pub. No.: US 2001/0049697 A1**(43) **Pub. Date: Dec. 6, 2001**(54) **SYSTEM AND METHOD FOR RETRIEVING
SOFTWARE RELEASE INFORMATION**(22) Filed: **Apr. 10, 1998****Publication Classification**(76) Inventors: **THOMAS M. JOHNDREW**, APTOS,
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SAN JOSE, CA 95164-0640 (US)(57) **ABSTRACT**

A method for retrieving software release information. A first step obtains a software defect data set, a second step obtains a software release data set, and a third step obtains a software release schedule data set. A fourth step relates at least two of the data sets to create an organized data set. A final step displays the contents of the organized data set thereby enabling a user to retrieve software release information.

(*) Notice: This is a publication of a continued prosecution application (CPA) filed under 37 CFR 1.53(d).

(21) Appl. No.: **09/058,943**

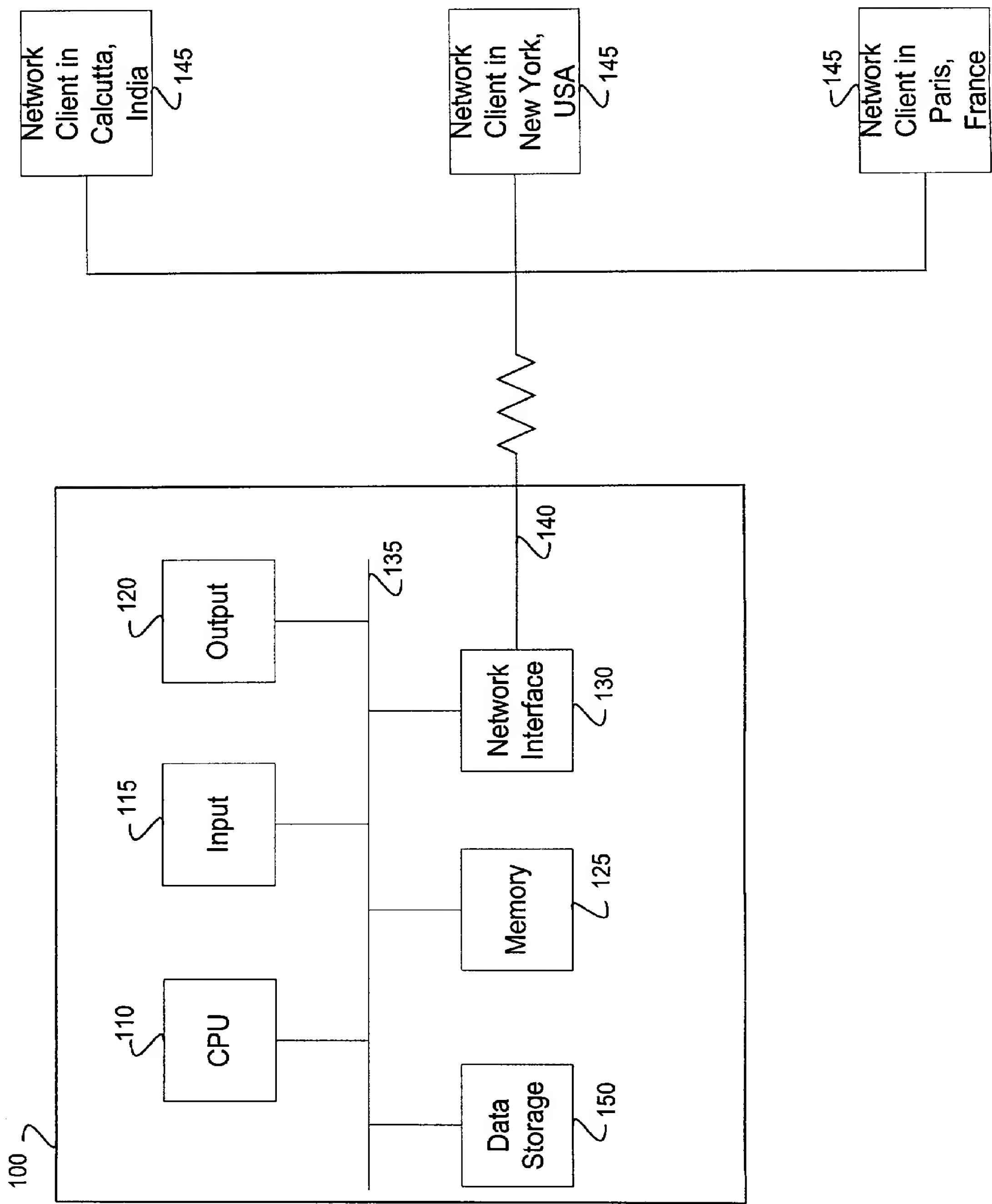


FIG. 1

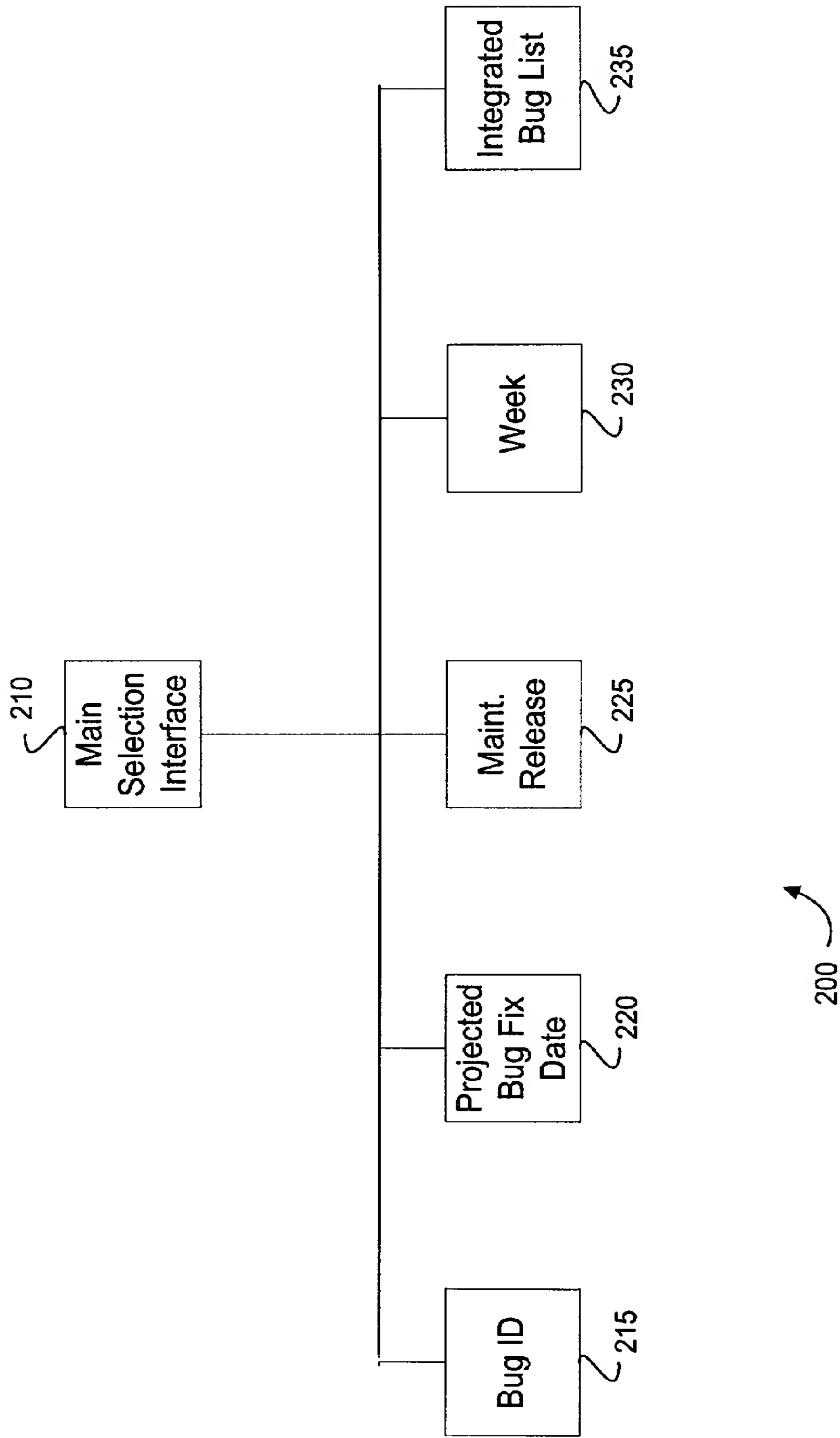


FIG. 2

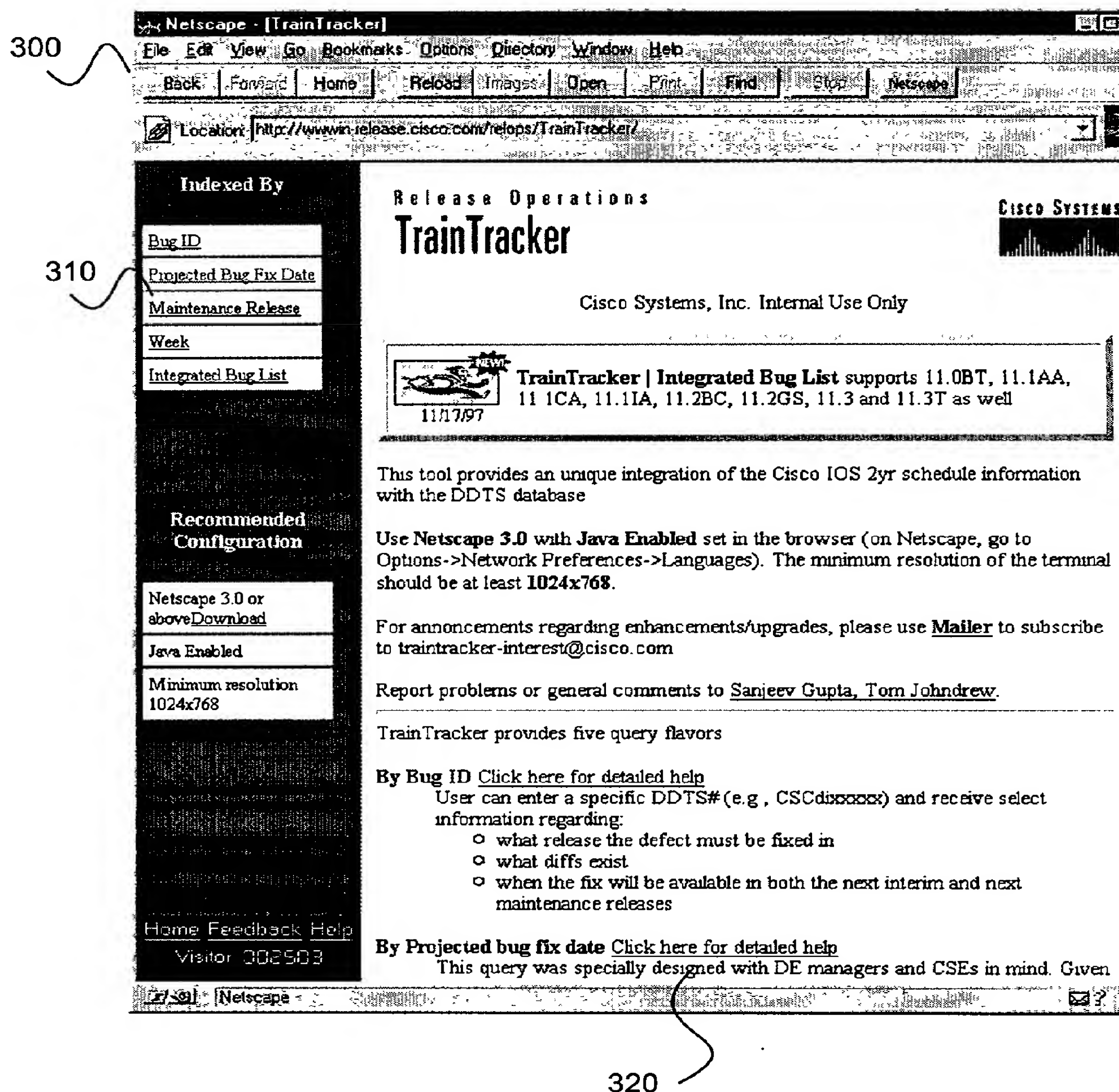


FIG. 3

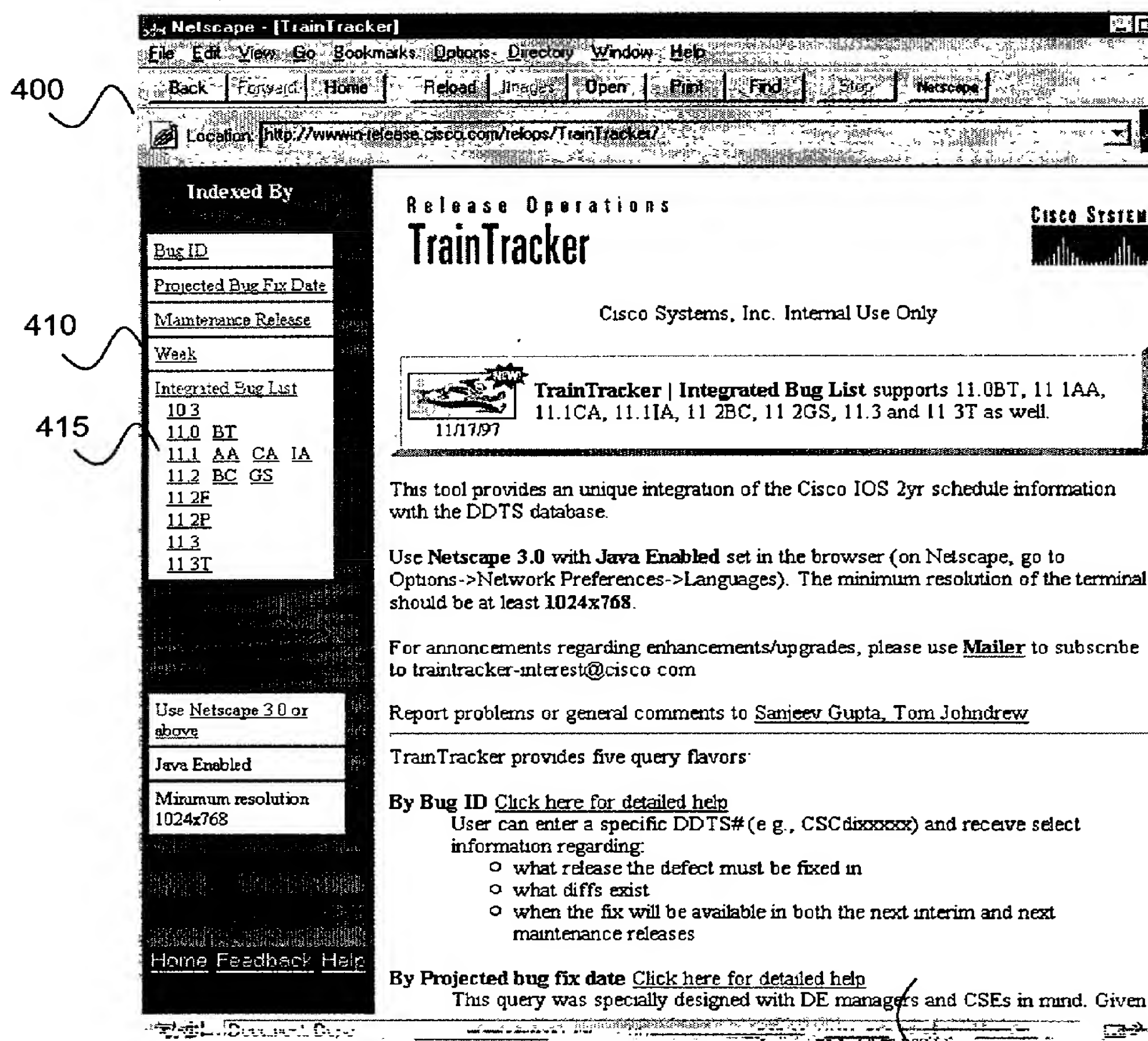


FIG. 4

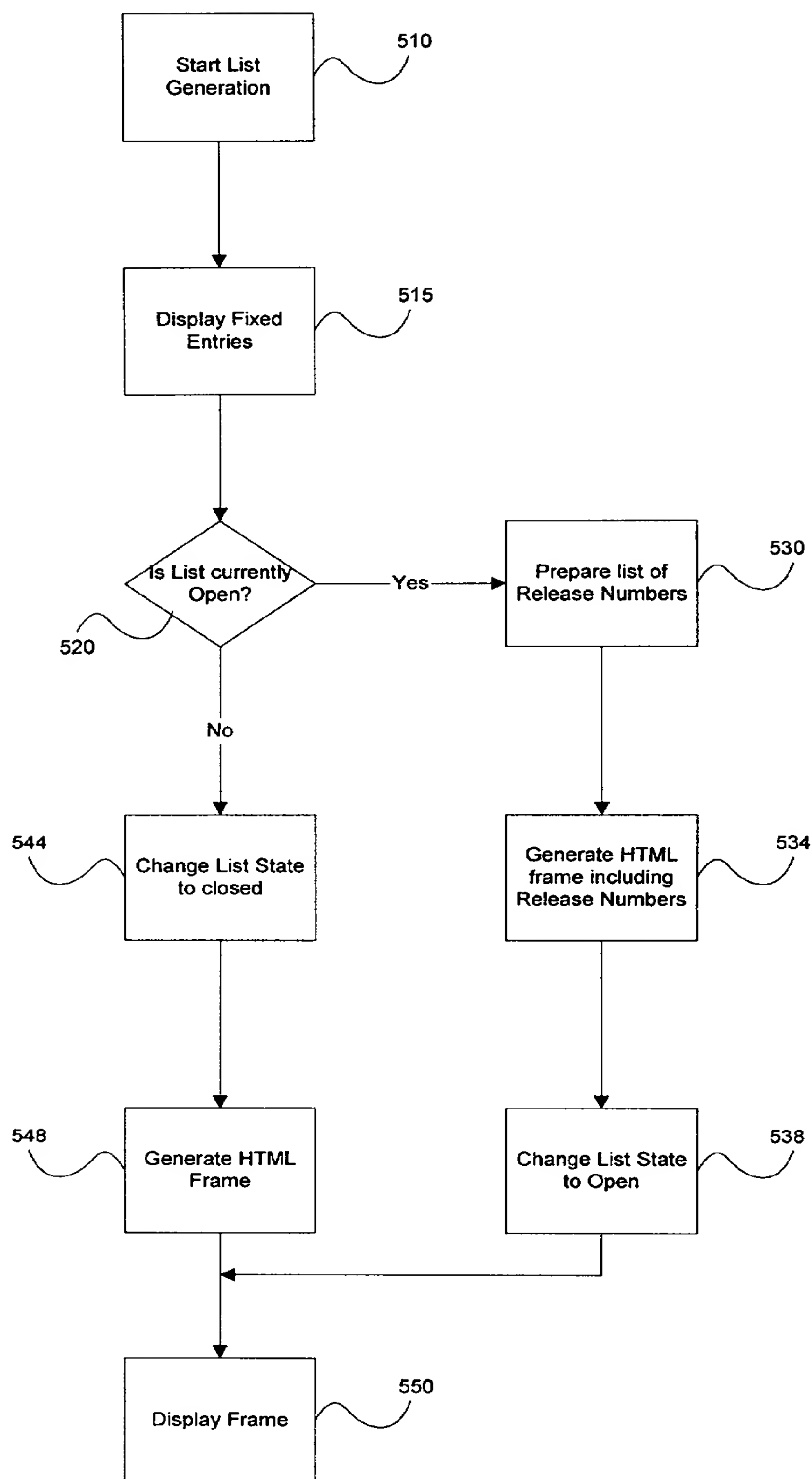


FIG. 5

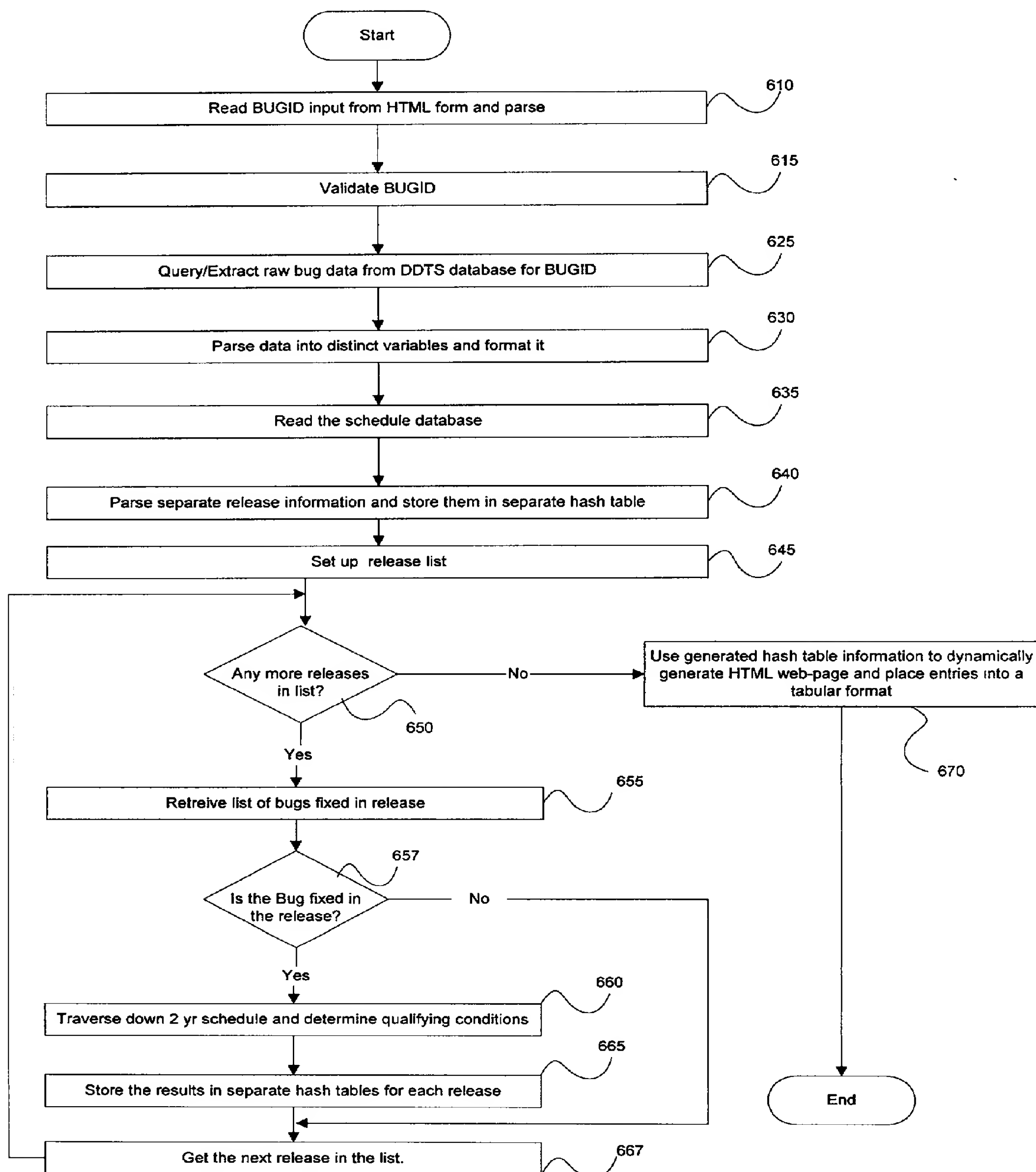


FIG. 6

Netscape - [TrainTracker]

File Edit View Go Bookmarks Options Directory Window Help

Back Forward Home Reload Images Open Print Find Stop Netscape

Location: <http://www-release.cisco.com/reltops/TrainTracker/>

Bug ID: CSCdi71609 Enclosures **705** [Help](#)

Headline: misaligned copying of data may cause system failures **710**

| Release | To be Fixed in | Date of Diff's (s/r/m) | Next Interim Build date | Next Maintenance Release CCO date |
|---------|----------------|------------------------|---------------------------|-----------------------------------|
| 10.3 | ◆ | ◆ 10/30/96 12:11 | 10.3(16.1) 11/04/96 | 10.3(17) 01/27/97 |
| 11.0 | ◆ | ◆ 10/30/96 13:35 | 11.0(12.1) 11/04/96 19:03 | 11.0(13) 12/16/96 |
| 11.1 | ◆ | ◆ 10/30/96 12:18 | 11.1(7.2) 11/04/96 13:20 | 11.1(8) 12/16/96 |
| 11.2 | ◆ | ◆ 11/01/96 16:00 | 11.2(1.5) 11/04/96 | 11.2(2) 11/25/96 |
| 11.2P | 725 | 730 | 735 | 740 |
| 11.2F | | | | |
| 11.3 | | | | |
| 11.3T | 720 | | | |

Engineer: skufer **DE Manager:** jack **Code Reviewer:** daubert

- Interim build availability after actual build date.
 - For internal testing: +48 hours.
 - On CCO: +5 business days to accommodate for Autons testing, debug and analysis.
- TrainTracker information provided using...
 - dumpbug -R CSCdi71609
 - NGRP 2 year schedule Revision: 3.3, Date: 3/27/98

Indexed By

Bug ID

Projected Bug Fix Date

Maintenance Release

Week

Integrated Bug List

Recommended Configuration

Netscape 3.0 or above [Download](#)

Java Enabled

Minimum resolution 1024x768

[Home](#) [Feedback](#) [Help](#)

Visitor 002503

Document Done

FIG. 7

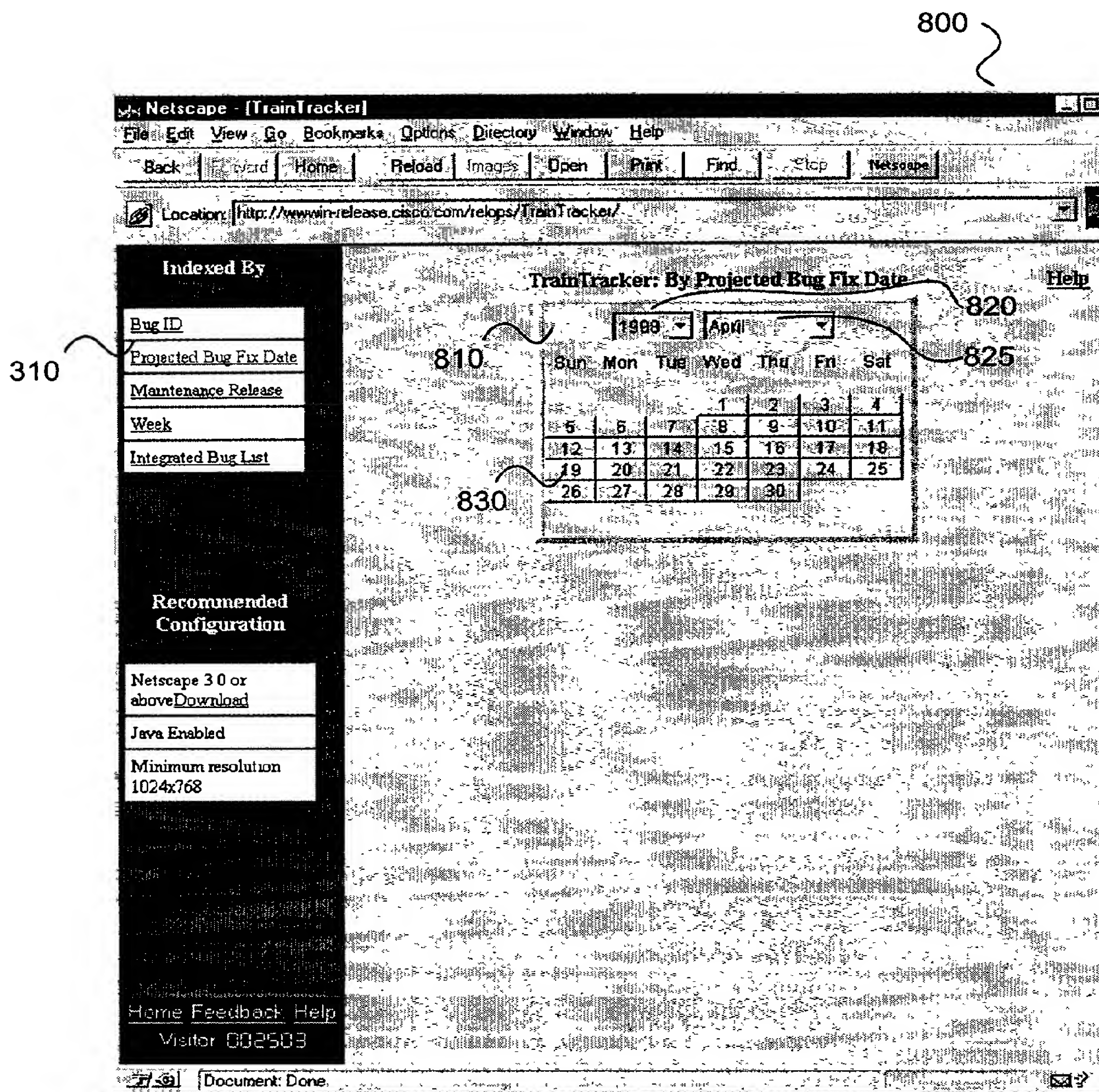


FIG. 8

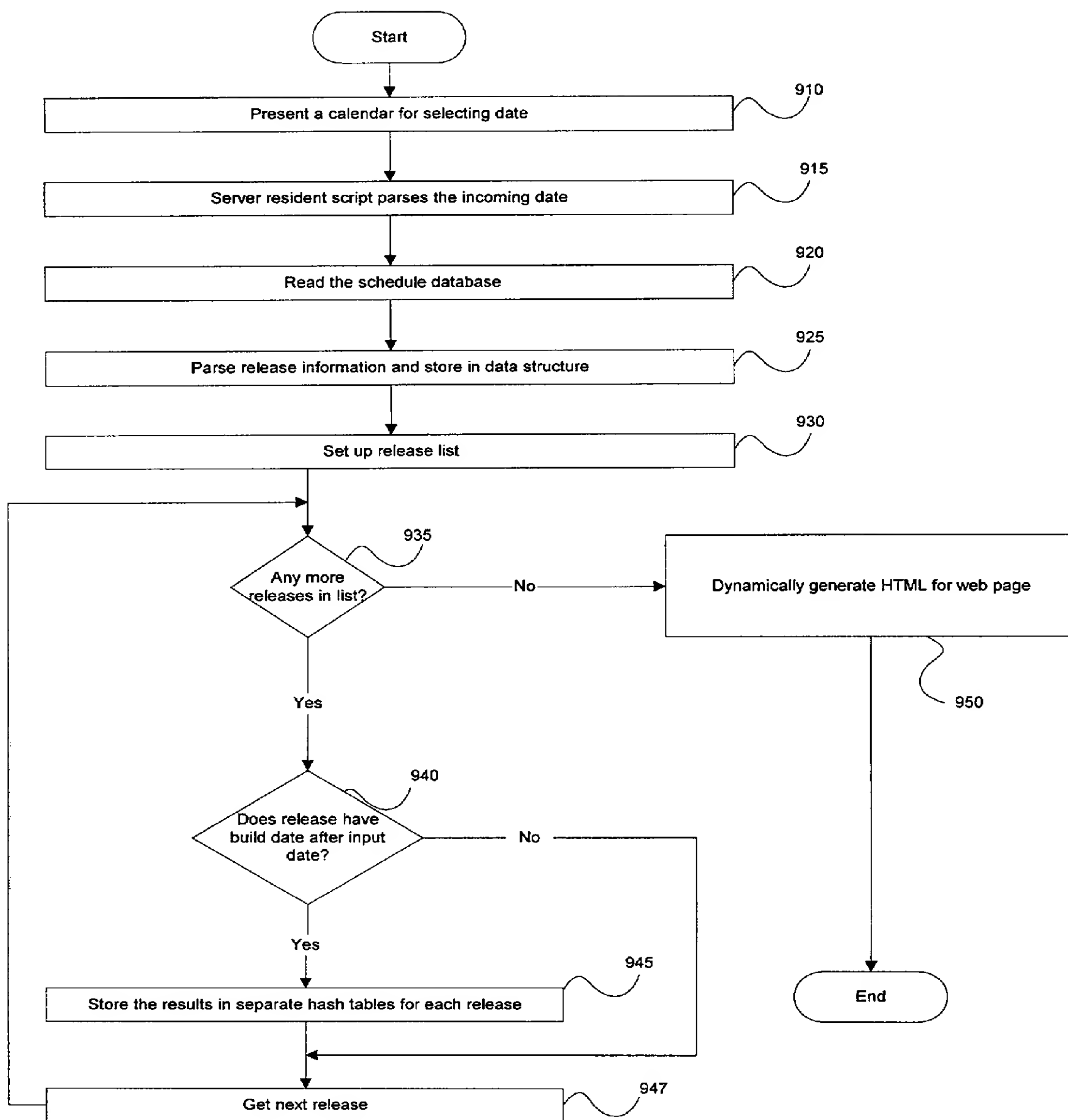


FIG. 9

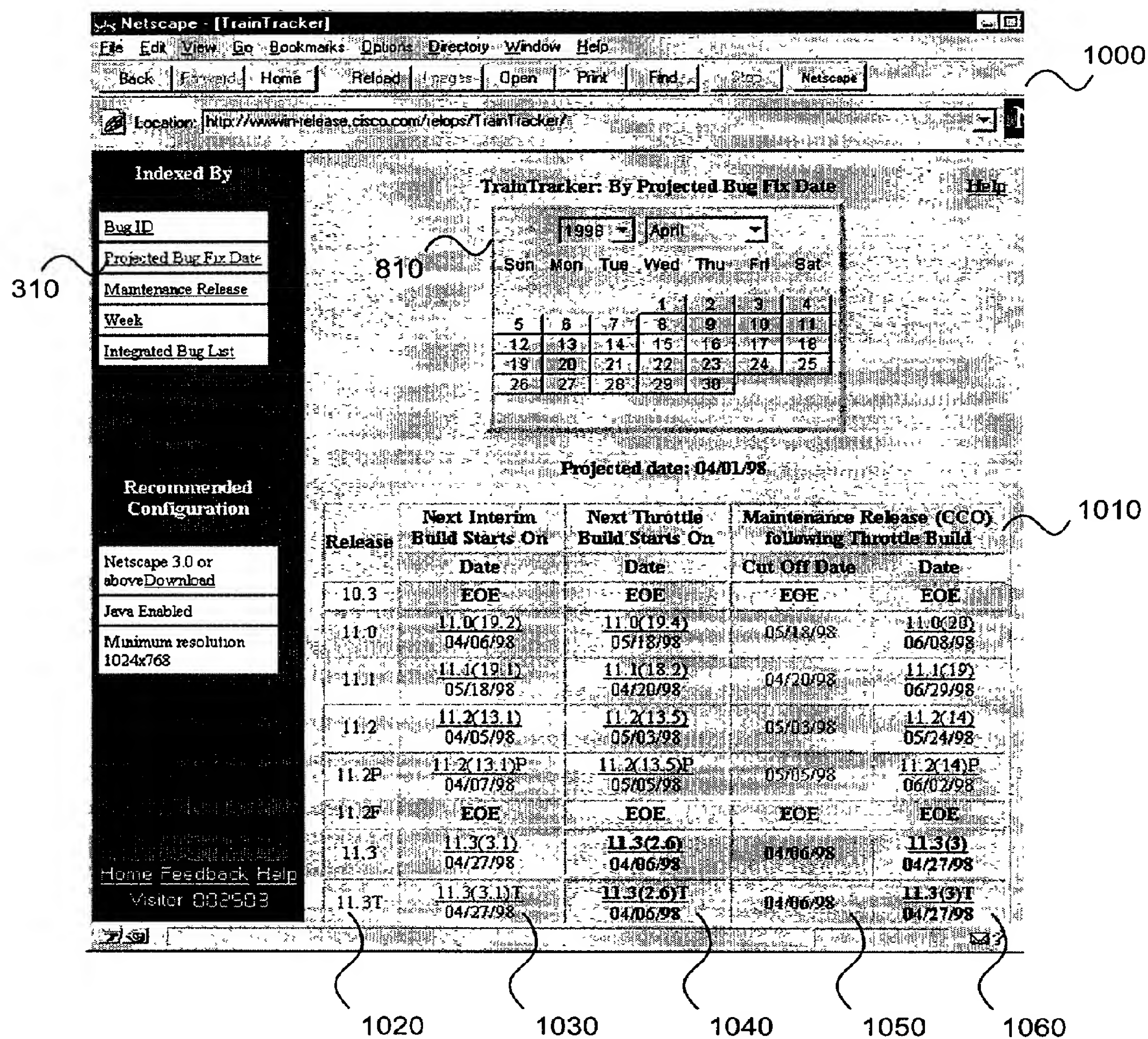


FIG. 10

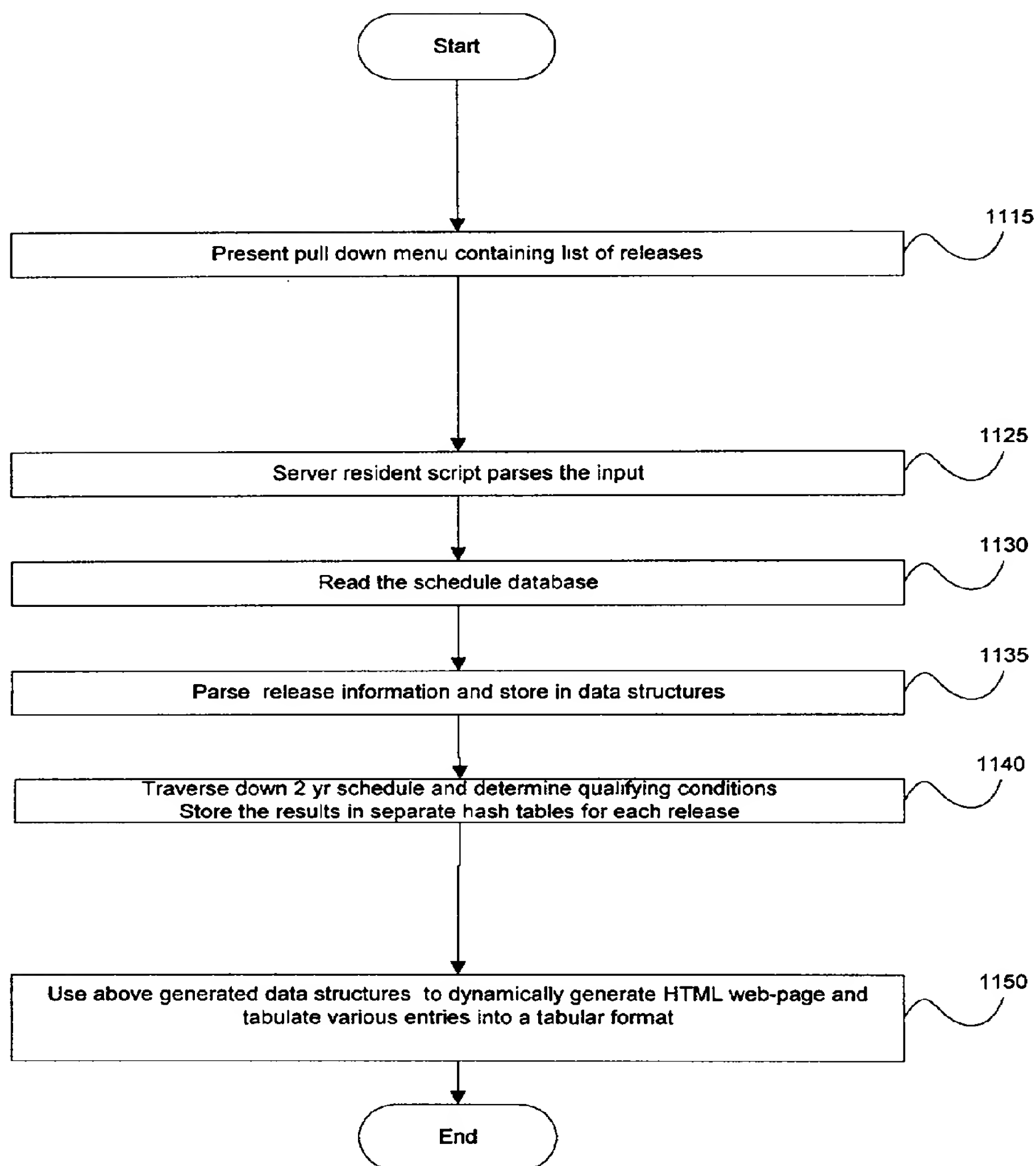


FIG. 11

Netscape - [TrainTracker]

File Edit View Go Bookmarks Options Directory Window Help

Back Forward Home Reload Images Open Print Find Stop Netscape

Location: <http://www-release.cisco.com/reltops/TrainTracker/>

Indexed By

Bug ID

Projected Bug Fix Date

Maintenance Release

Week

Integrated Bug List

Recommended Configuration

Netscape 3.0 or above [Download](#)

Java Enabled

Minimum resolution 1024x768

Home Feedback Help

Visitor 002503

Projected Dates for Cisco IOS Release 11.2

| Cisco IOS Release | CCO FCS | Mfg FCS |
|-------------------|----------|----------|
| 11.2(1) | 10/07/96 | 10/14/96 |
| 11.2(2) | 11/25/96 | 12/02/96 |
| 11.2(3) | 01/06/97 | 01/13/97 |
| 11.2(4) | 02/17/97 | 02/24/97 |
| 11.2(5) | 04/07/97 | 04/14/97 |
| 11.2(6) | 05/12/97 | 05/19/97 |
| 11.2(7) | 06/23/97 | 06/30/97 |
| 11.2(8) | 08/11/97 | 08/18/97 |
| 11.2(9) | 09/29/97 | 10/06/97 |
| 11.2(10) | 11/17/97 | 11/24/97 |
| 11.2(11) | 01/12/98 | 01/19/98 |
| 11.2(12) | 03/02/98 | 03/09/98 |
| 11.2(13) | 04/06/98 | 04/13/98 |

1220 1230 1240

Based on NGRP 2 year schedule Revision: 3.3 Date: 3/27/98

Document: Done

FIG. 12

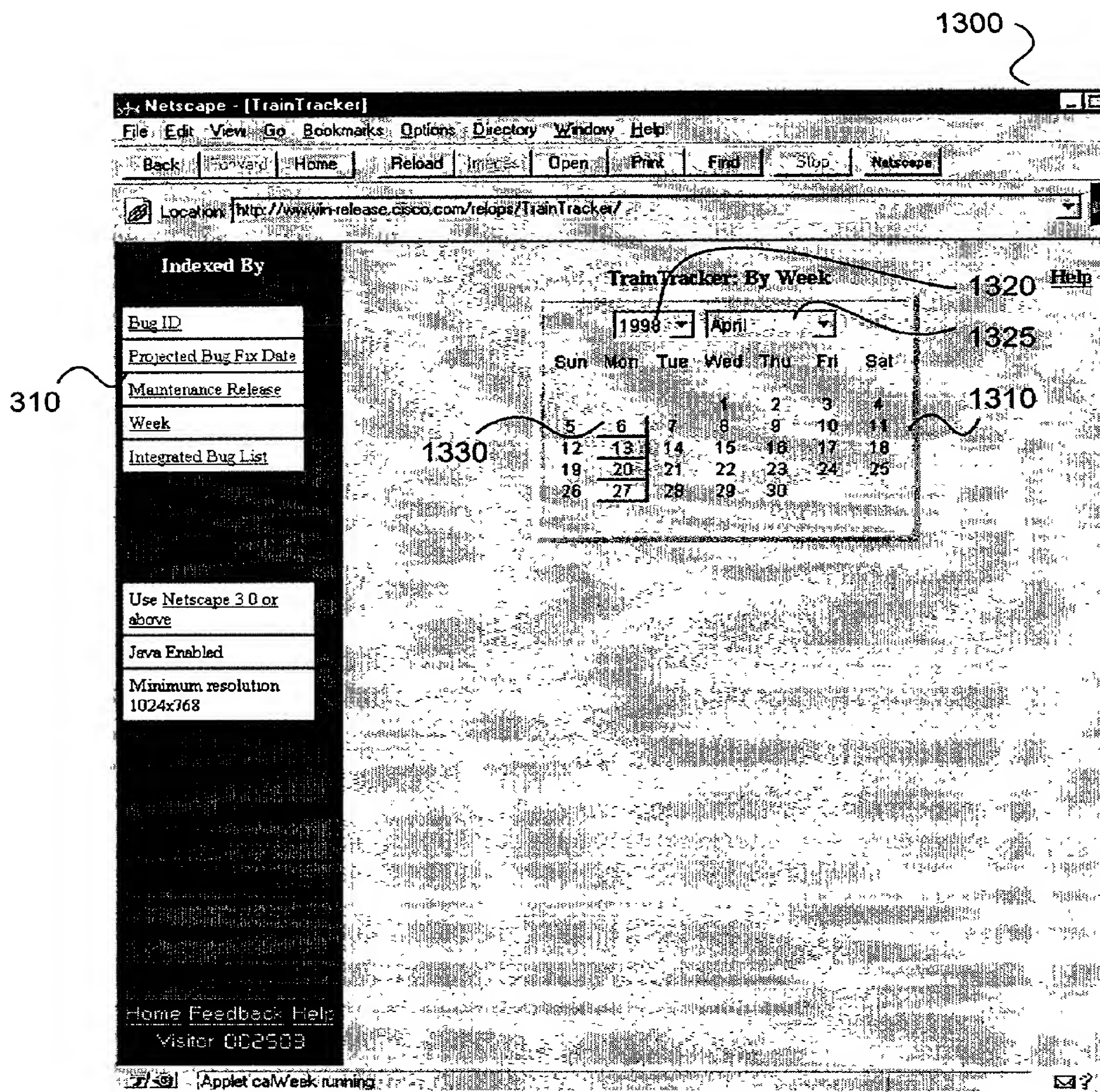


FIG. 13

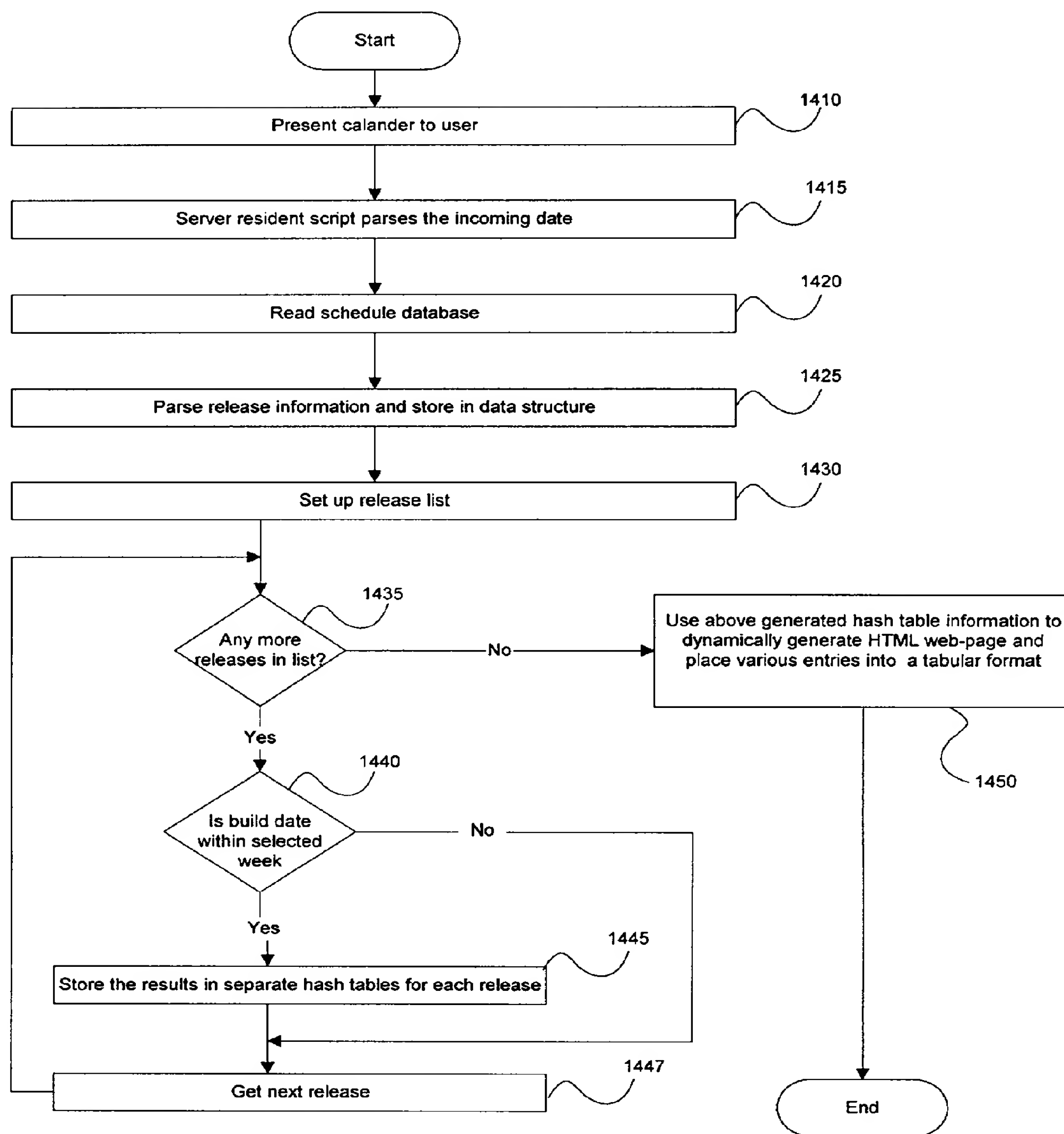


FIG. 14

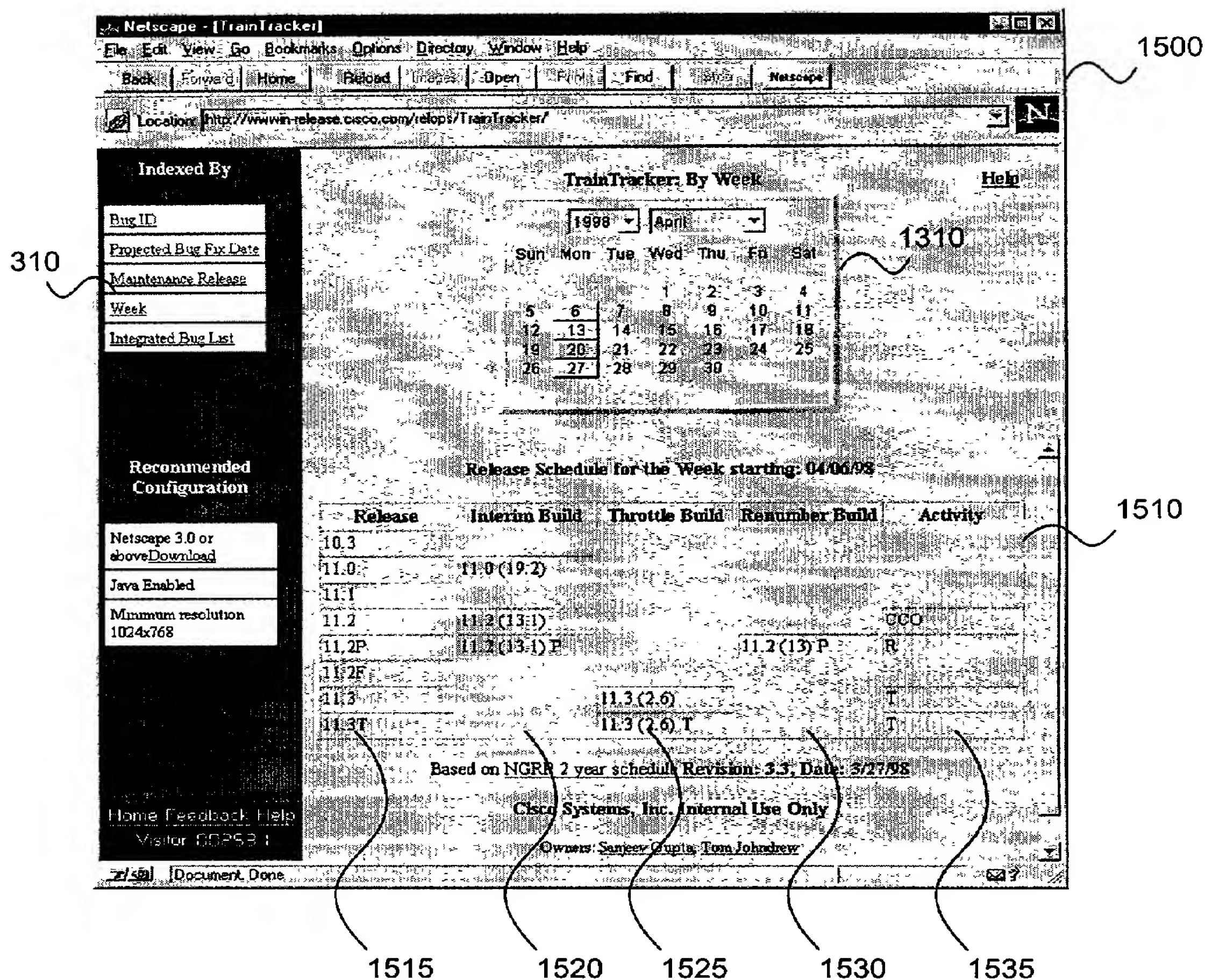


FIG. 15

Indexed By

- [Bug ID](#)
- [Projected Bug Fix Date](#)
- [Maintenance Release](#)
- [Week](#)
- [Integrated Bug List](#)

Interim and Maintenance builds for Release 11.2

| 1.1 | 2.1 | 3.1 | 4.1 | 5.1 | 6.1 | 7.1 | 8.1 | 9.1 | 10.1 | 11.1 | 12.1 |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| 1.2 | 2.2 | 3.2 | 4.2 | 5.2 | 6.2 | 7.2 | 8.2 | 9.2 | 10.2 | 11.2 | 12.2 |
| 1.3 | 2.3 | 3.3 | 4.3 | 5.3 | 6.3 | 7.3 | 8.3 | 9.3 | 10.3 | 11.3 | 12.3 |
| 1.4 | 2.4 | 3.4 | 4.4 | 5.4 | 6.4 | 7.4 | 8.4 | 9.4 | 10.4 | 11.4 | 12.4 |
| 1.5 | 2.5 | 3.5 | 4.5 | 6 | 6.5 | 7.5 | 8.5 | 9.5 | 10.5 | 11.5 | 13 |
| 2 | 3 | 4 | 4.6 | | 7 | 8 | 9 | 10 | 11 | 12 | |
| | | | 5 | | | | | | | | |

Integrated Bug List

TrainTracker | Integrated Bug List supports 11.0BT, 11.1AA, 11.1CA, 11.1IA, 11.2BC, 11.2GS, 11.3 and 11.3T as well.

DISCLAIMER

Comments and feedback regarding the Integrated Bug List feature are strongly encouraged

Improved Integrated Bug List Features.

1. List are supported back to version 1.1
2. Bug fixes total available for quick reference
3. Selecting the maintenance version gives you all bugs fixed in that release.
4. Based on CVS and Clearcase repository information for better accuracy
5. Separate database used (mirrored from Build archive information)

Future Enhancements

- Add functionality to view files modified by a bug fix

FIG. 16

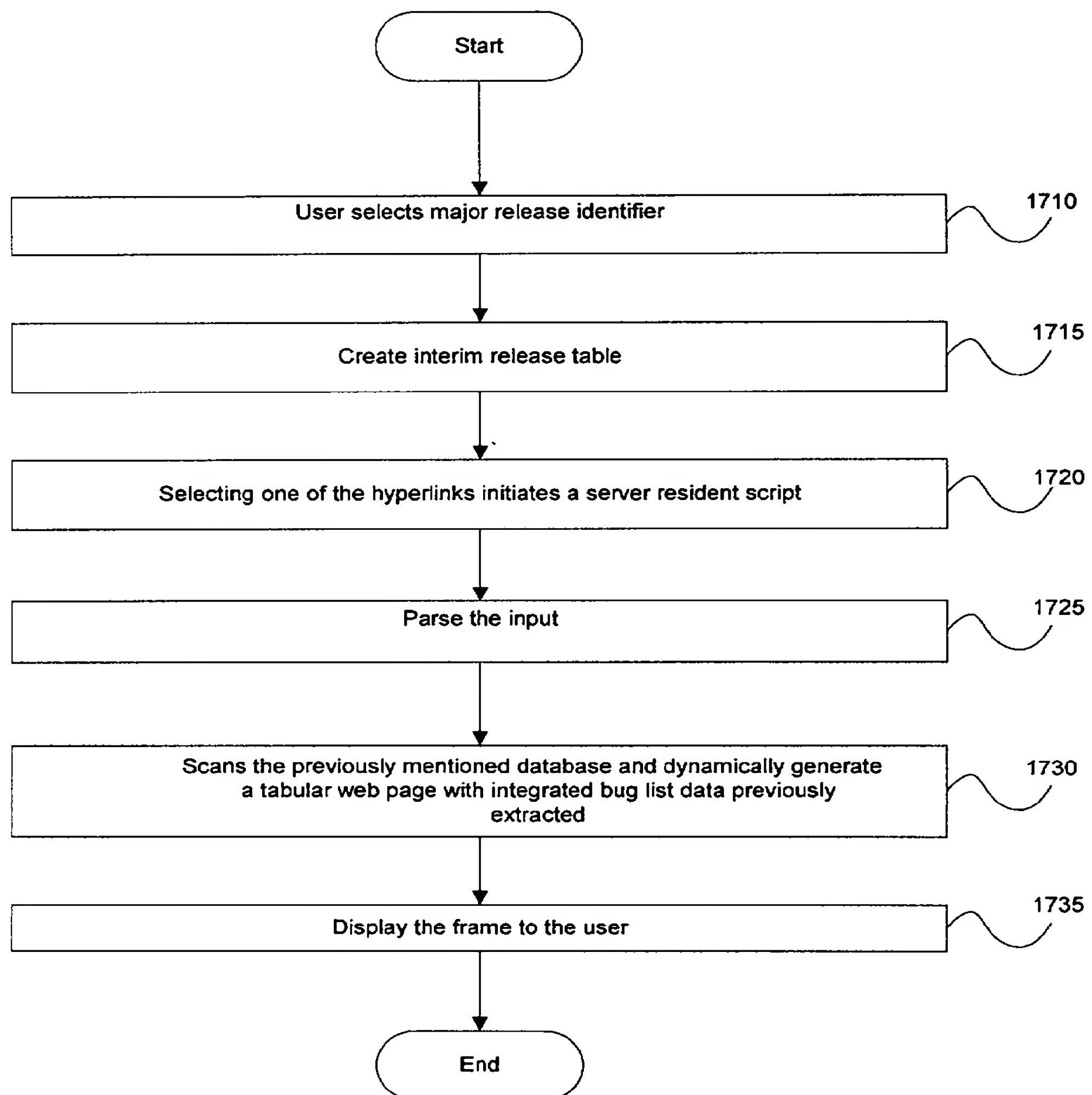


FIG. 17

Indexed By

- Bug ID
- Projected Bug Fix Date
- Maintenance Release
- Week
- Integrated Bug List
 - 10.3
 - 11.0 BT
 - 11.1 AA CA IA
 - 11.2 BC GS
 - 11.2F
 - 11.2P
 - 11.3
 - 11.3T

Use Netscape 3.0 or above

Java Enabled

Minimum resolution 1024x768

Home Feedback Help

Visitor 882504

Interim and Maintenance builds for Release 11.2

| | | | | | | | | | | | About |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|-------|
| 1.1 | 2.1 | 3.1 | 4.1 | 5.1 | 6.1 | 7.1 | 8.1 | 9.1 | 10.1 | 11.1 | 12.1 |
| 1.2 | 2.2 | 3.2 | 4.2 | 5.2 | 6.2 | 7.2 | 8.2 | 9.2 | 10.2 | 11.2 | 12.2 |
| 1.3 | 2.3 | 3.3 | 4.3 | 5.3 | 6.3 | 7.3 | 8.3 | 9.3 | 10.3 | 11.3 | 12.3 |
| 1.4 | 2.4 | 3.4 | 4.4 | 5.4 | 6.4 | 7.4 | 8.4 | 9.4 | 10.4 | 11.4 | 12.4 |
| 1.5 | 2.5 | 3.5 | 4.5 | 6 | 6.5 | 7.5 | 8.5 | 9.5 | 10.5 | 11.5 | 13 |
| 2 | 3 | 4 | 4.6 | 5 | 7 | 8 | 9 | 10 | 11 | 12 | |

Composite List of Bugs Integrated in Release: 11.2 (8)

Total Bug Fixes: 328

| Release (Number of Fixes) | Bug ID | Sev. | Description |
|---------------------------|------------|------|---|
| 8 (5) | CSCdj18895 | 2 | Number of active calls and B channels incorrect |
| | CSCdj28715 | 2 | #connections/entities set to minimum (not default) |
| | CSCdj28787 | 2 | NAT doesn't translate an FTP port command retransmission |
| | CSCdj29550 | 1 | appn images crashed - illegal access to a low address |
| | CSCdj31496 | 2 | regression problems with CSCdj73194 commit |
| 7.5 (5) | CSCdj24942 | 3 | Clear modem clears all modems including currently active ones |
| | CSCdj26436 | 3 | Calls rejected after E1 PRI is disconnected with active call |
| | CSCdj27308 | 3 | Broadcasts on a frame relay mfr use double bandwidth when TS active |
| | CSCdj27747 | 2 | The outputs of show traffic and show traffic stat got swapped |

FIG. 18

SYSTEM AND METHOD FOR RETRIEVING SOFTWARE RELEASE INFORMATION

BACKGROUND OF THE INVENTION

[0001] 1. Field of the Invention

[0002] The present invention relates generally to methods for obtaining information about software, and more particularly for obtaining and displaying information about software releases.

[0003] 2. Discussion of Background Art

[0004] The development and maintenance of computer software is affected by a number of issues. There are an almost innumerable number of combinations of hardware, software and network environments that must be supported. Often, many of these environments are incompatible with each other. In addition, each of the environments undergoes rapid change as technology advances in their respective areas. As a result, it can be expected that a computer software product will require many changes during its life cycle.

[0005] A typical software development process has four major phases. The first is the design phase, where the operating characteristics of the software are defined. This is followed by the development phase, where programmers and engineers write the software to meet the requirements defined during the design phase. The third phase is the test phase, where the software is tested to ensure that it meets the requirements defined during the design phase, and has no major problems. The fourth phase is the release phase, where the software is provided to customers and other end users. During the development, test and release phases of the software life cycle, problems or design issues may be encountered where the software does not operate in a desirable way. These problems are often called "bugs." In addition, it is often desirable to add new features to the software as customer needs become more evident. Fixing bugs and adding features require the initiation of a new cycle of design, development, test and release phases.

[0006] It is typical in the software industry to organize releases of new software in a hierarchical manner. A major release of software is one in which significant changes have been made to the software. For example, significant new functionality may have been added or removed, or the software's user interface may have been dramatically changed. A minor release is typically one in which bugs have been fixed and improvements have been added to the software, but no major functionality has changed. In addition, there may be other releases of software that are below the level of a minor release, such as a maintenance release, an interim release, a test release or an emergency bug-fix release. These releases typically do not encompass as many bug fixes or other changes to the software. All of these releases are commonly assigned identifiers in order to distinguish them from one another. A commonly used format for identifiers is a series of numbers, separated by periods or enclosed within parentheses which identify the major and maintenance release levels for the software. For example, the identifier "11.2(13)" may indicate major release 11.2 and maintenance release 13 within that major release.

[0007] In addition, build numbers may be used in combination with release numbers to identify software. A software

build is the process of compiling and linking all of the components of a software product. Typically many different programs and modules make up a software product, and they must all be assembled into a package. A build number is essentially a sequence number assigned to the software. For example an identifier "11.2(6.1)" may indicate build 6.1 for major release 11.2 of a software product. During the development and maintenance process many reasons for building software occur. For example a maintenance build is a software build intended to be released to customers that fixes bugs that have been discovered since the last release of the software. An interim build is intended to be used by internal users to test the software before releasing it to customers or for repairing software in response to urgent customer problems. A throttle build is used for final testing of a software product before final approval, and therefore must incorporate very tight change controls. A renumber build is one that has been tested and is built again to be labeled with a new release number or identifier.

[0008] Many different parties with varying needs are acutely interested in the status of particular releases of software. Software developers need to know when the software they are working on must be ready in order to meet the deadline for a scheduled release. Customers want to know when software will be available that fixes problems they are encountering. Technical writers want to know what bug fixes and features will be included in new releases so that they can create documentation on the bug-fix or features. Product managers and customer service engineers want to know what bugs or features are included in a release so that they may accurately convey the information to current or potential customers. Each of these parties has a wide range of expertise in dealing with computers and software, varying from novice to expert.

[0009] In addition, these parties may be in very different locations. The development staff may be in one location, the maintenance staff in another, and the technical writers in yet another location. Customer service engineers and the customers may be scattered around the world.

[0010] In the past, specialized products have been developed to meet some of the individual needs of these parties. Software source code control systems have been created to allow software developers to control and identify changes to software. Additionally, software developers have benefited from software development environments which have been created to control the compiling and linking that occurs during the build process. Other systems and methods have been created to control and maintain the schedule of major and minor releases. Still other systems have been developed to report and track the history of bugs and enhancement requests. Each of these systems typically maintains their own database, each has their own user interface, and each may be centrally located and controlled.

[0011] Unfortunately, for a person to obtain complete and accurate information on a software release, he or she must have access to and knowledge of how to use the various tools that have been developed to address the individual aspects of software development issues detailed above. In addition, the user must often either have the required software on their own personal computer or be located on the same internal corporate network.

[0012] In response to these concerns, what is needed is a method for retrieving software release information that can

be used in a variety of locations and environments, that can be used by novices and experts alike, and that overcomes the problems of the prior art.

SUMMARY OF THE INVENTION

[0013] The present invention provides a system and method for retrieving software release information. One component within the system of the present invention automatically gathers data from various databases and displays information on the releases containing a fix for an identified defect. A second component determines a date by which a bug must be fixed if it is to be included in an identified release. A third component presents the dates of various software release events associated with a particular release. A fourth component identifies all of the software release events that are to occur within a user specified week. A fifth component automatically generates a list of defects already integrated into a particular software release.

[0014] All of the above described components dynamically generate HTML defining a web page thereby enabling the display of the software release information on displays located anywhere in the world having a network connection to a computer implementing the system and method of the present invention.

[0015] These and other aspects of the invention will be recognized by those skilled in the art upon review of the detailed description, drawings, and claims set forth below.

BRIEF DESCRIPTION OF THE DRAWINGS

[0016] FIG. 1 is a block diagram of a computer system including a software release information system in accordance with the present invention;

[0017] FIG. 2 is a block diagram of the software release information system;

[0018] FIG. 3 is a graphical depiction of the initial display output of the preferred embodiment;

[0019] FIG. 4 is a graphical depiction of the display output after the "Integrated Bug List" link in FIG. 3 has been selected;

[0020] FIG. 5 is a flowchart describing the transition from the display output in FIG. 3 to the display output in FIG. 4;

[0021] FIG. 6 is a flowchart for collecting data based on Bug ID;

[0022] FIG. 7 is a graphical depiction of a display output of the data collection produced using the process of FIG. 6;

[0023] FIG. 8 is a graphical depiction of a display output allowing a user to select a particular Projected Bug Fix Date;

[0024] FIG. 9 is a flowchart for collecting data based on a Projected Bug Fix Date;

[0025] FIG. 10 is a graphical depiction of a display output of the data collection produced using the process of FIG. 9;

[0026] FIG. 11 is a flowchart for collecting data based on a Maintenance Release Identifier;

[0027] FIG. 12 is a graphical depiction of a display output of the data collection produced using the process of FIG. 11;

[0028] FIG. 13 is a graphical depiction of a display output allowing a user to select a particular week of a year;

[0029] FIG. 14 is a flowchart for collecting data based on an input of a particular week of a year;

[0030] FIG. 15 is a graphical depiction of a display output showing the data collection produced using the process described in FIG. 14;

[0031] FIG. 16 is a graphical depiction of a display output for allowing the selection of a particular release identifier;

[0032] FIG. 17 is a flowchart for gathering a data collection based on the selection of a particular release identifier; and

[0033] FIG. 18 is a graphical depiction of a display output showing the data collection produced using the process described in FIG. 17.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0034] FIG. 1 is a block diagram of a computer system 100, which includes one or more Central Processing Units 110, an input device 115 such as a keyboard or a mouse, an output device 120 such as a Cathode Ray Tube (CRT) display, Random Access Memory (RAM) 125, data storage 150 including Read Only Memory (ROM) and other long term storage devices such as hard disk drives, CD-ROM Drives or similar devices, and a communications interface 130, all coupled together via a signal bus 135. Data storage 150 holds the various databases associated with a software release information retrieval system. Communications interface 130 is connected to a network 140 such as a local area network, a wide area network, or the Internet. Network 140 connects computer system 100 to network clients 145. Network clients 145 comprise diskless workstations, main-frame systems, minicomputer systems, personal computers, laptop computers, palm computers or television based web browser systems. Network clients 145 can be located anywhere in the world where the network client can connect to network 140. Additionally, network 140 may connect computer system 100 to remote file and database servers containing databases used with the software release information system.

[0035] FIG. 2 is a block diagram of the major components of a release information system 200 of the present invention. For interacting with the release information system 200 a preferred user interface is a web browser such as Netscape Navigator or Microsoft's Internet Explorer. Those skilled in the art will recognize that while the use of such browsers allows the release information system 200 to display information in a manner independent of device and hardware platform, there exist alternatives for displaying the information produced by release information system 200, which could be readily substituted. The components of the invention are implemented preferably using the Java or Perl programming languages, however other programming languages could be substituted.

[0036] In release information system 200 the first significant display output is the Main Selection Interface 210 which lists the major sub-components of system 200 and allows a user to select and invoke a desired sub-component. Preferably, the display output list of major sub-components

is a list of hyperlinks which upon selection take the user to the selected sub-component interface. The present invention includes sub-component modules to present information to the user by Bug ID 215, Projected Bug Fix Date 220, Maintenance Release Identifier 225, Week 230 and Integrated Bug List 235.

[0037] FIG. 3 shows the initial display output of the preferred embodiment. Initial screen 300 is a page of output data and is shown as it would appear when displayed using the web browser Netscape Navigator. Initial screen 300 comprises two functional areas, a query component selection index 310 and a text region 320. Query component selection index 310 is preferably implemented as a list of hyperlinks, with each entry of the list representing one of the major components detailed with reference to FIG. 2. A user may select a query component by moving a mouse to position a cursor over the desired hyperlink and clicking a mouse button. Some query components when selected may present an expanded list of additional selectable items. In the preferred embodiment, text region 320 displays descriptive text and images about the present invention, and a selection interface to obtain further information about the system.

[0038] FIG. 4 shows the display output after the "Integrated Bug List" link has been selected from query component selection index 310 of FIG. 3. Screen 400, similarly to screen 300, comprises text region 320 and an expanded query selection index 410 which includes the additional information of a list of selectable major release identifiers 415.

[0039] FIG. 5 is a flowchart describing the steps involved in the transition from the display output in FIG. 3 to the display output in FIG. 4 and back again. (The method is implemented by conventionally available computer equipment shown in FIG. 1.) This method is initiated when the user selects the "Integrated Bug List" link from query component selection index 310 in FIG. 3 or 410 in FIG. 4. The method begins in step 510, with the initialization of conventional data structures. Next, step 515 creates a list of entries common to the display output in FIG. 3 and FIG. 4. In the preferred embodiment, this list comprises hyperlink entries titled "Bug ID," "Projected Bug Fix Date," "Maintenance Release," "Week" and "Integrated Bug List." Next, in step 520, the method checks a list state variable to see if the list of selectable major release identifiers is currently being displayed (open, as in FIG. 4) or not (closed, as in FIG. 3).

[0040] If the list state variable is currently open, the method proceeds to step 544 and changes the list state variable to closed. Next, in step 548, an HTML frame is generated to display the list to the user. Those skilled in the art will recognize that alternative methods to HTML are available to generate a screen to be displayed to a user.

[0041] If the list state variable is currently set to closed, the method proceeds to step 530 and queries a database to determine a list of currently active release identifiers. The database is comprised of preferably a computer file system directory structure in which directory names indicate releases. Alternative databases such as a file, spreadsheet, relational database management system or object oriented database could be substituted. Next, step 534 generates an HTML frame containing the currently active release from step 530 and the fixed list entries from step 515. Next, in step 538, the list state variable is changed to open to reflect the current list state.

[0042] In the final step 550 the HTML frame just generated is displayed to the user. This step will display the page in FIG. 3 if the list state variable is closed or the page in FIG. 4 if the list state variable is open.

[0043] FIG. 6 is a flowchart for collecting data based on Bug ID and further describes component 210 of FIG. 2. The method begins in step 610, where the user inputs a bug identifier preferably read from an entry on an HTML form or selected from a list of available bug identifiers, entered onto a database form, etc. Next, in step 615, the bug identifier is compared to a list of valid bug identifiers. If the bug identifier is invalid, no further processing will take place and the user will be allowed to enter an alternative bug identifier. The method proceeds to step 625 where data regarding an identified bug is read from a database containing information about software bugs. Next, in step 630, a subset of the data returned in step 625 is stored into data structures describing the bug. This data structure is preferably a hash table, with the bug identifier used as a hash key. Alternatives such as an array or linked list could be substituted. Next, in step 635, a schedule for software releases is read from a software release database. The release schedule database is preferably a tab-delimited file containing a two year span of schedule information. Alternative database mechanisms could be substituted and other time span lengths could be chosen as necessary. The method proceeds to step 640 where relevant data about each release is stored in a data structure describing the software release. This data structure is preferably also a hash table with the release identifier used as a hash key. Next, step 645 builds a data structure representing a list of releases.

[0044] Step 650 in FIG. 6 begins a loop that iterates over each release in the list of releases by checking whether any releases remain in the list. If a release is in the list, the method proceeds to step 655 which retrieves from the release database a list of bugs fixed in each release. In addition, this step adds to the list those bugs that have been committed to be fixed in the release, but have not yet been fixed. Next, step 657 checks whether the current bug identifier is included in the list of bugs actually fixed or committed to be fixed for the release. If not, the method proceeds to step 667. If the list of bugs includes the current bug identifier, then step 660 retrieves the schedule information for the release. Next, in step 665, the schedule information from step 660 is stored in a data structure, preferably a hash table, describing the release schedule. Step 667 retrieves the next release in the list. The method then returns to the top of the loop and step 650.

[0045] When no release remains in the list, step 650 directs the method to step 670 in which the information from the data structures describing the bug, and the information in the data structures describing the software release are used to dynamically generate HTML that produces the web page shown in FIG. 7. One could substitute other methods of output such as a database form or a PDF file designed to be used by the Adobe Acrobat page file reader.

[0046] FIG. 7 shows the data collected by the process of FIG. 6. Bug ID screen 700 includes the query component selection index 310, a bug identifier header 705, a bug headline 710 and a release table 715. Bug identifier header 705 gives the bug identifier associated with the information on the screen ("CSCdi71609" in FIG. 7). Bug headline 710

contains a short one line description of the bug. Release table **715** has rows describing a particular release and columns containing a data element describing an aspect of the release. Data for each column is obtained from the data structures describing the bug, the software release and the release schedule. Column **720** identifies the release. Column **725** indicates the status of the bug with regard to the release, preferably using a colored diamond. A red diamond indicates that the bug is scheduled to be fixed in the release identified in column **720**, but no further information is available on the status of the bug. A green diamond indicates that the bug has been fixed and the software will be integrated into the release identified in column **720**. A cyan diamond indicates that the bug has been fixed, even though it was not scheduled or committed for the release identified in column **720**. A gold diamond indicates that the bug is scheduled to be fixed in the release identified in column **720**. A magenta diamond indicates that a fix for the release has been approved for inclusion into the release identified in column **720**. Column **730** contains the date and time that software fixing the bug was implemented in the release. Column **735** contains the date that an interim build of the release either took place or will take place. Column **740** contains the date that a maintenance release either was released or will be released to customers.

[0047] **FIG. 8** shows the initial screen of component **220** of **FIG. 2**, a display output allowing a user to select a particular Projected Bug Fix Date. Input to this component is a date by which a fix for a bug is expected to be implemented. Screen **800** comprises the query component selection index **310** and a calendar **810** that contains a year drop down box **820** and a month drop down box **825**, which, when selected, present a list of years and months within a year. The calendar also contains a day button **830** for each day of the selected month and year. A user selects a particular date by choosing a year and month from drop down boxes **820** and **825**, and by pressing the day button for the desired day. The selected date is then input to the method described in **FIG. 9**.

[0048] **FIG. 9** is a flowchart for collecting data based on a Projected Bug Fix Date as done by component **220** of **FIG. 2**. The method starts with step **910** where the calendar based input screen of **FIG. 8** is presented to the user. Next, in step **915**, the system parses the date selected by the user. Step **920** reads from the software release database the schedule for software releases. Step **925** stores relevant data about each release in the data structure describing the software release. Step **930** builds a list of software releases.

[0049] Step **935** begins a loop that iterates over each software release in the list built in step **930**. Step **935** determines if unprocessed releases remain in the list. If at least one release remains then step **940** examines each data structure describing the software release to determine if the software release has a build date later than the date input in step **910**. If the software release does have a later date, then step **945** retrieves relevant data from the software release data structure and stores it in a release display data structure, preferably a hash table. The following step **947** obtains the next release, if any, in the list.

[0050] When all software releases in the list have been processed, step **935** directs the method to step **950**, which uses the release display data structure to dynamically gen-

erate HTML for a web page displaying a table of software release data similar to the table of **FIG. 10**.

[0051] **FIG. 10** shows a display of the data collected by the process of **FIG. 9**. Screen **1000** includes the query component selection index **310**, calendar **810**, and a release schedule table **1010** with each row representing an individual release and each column containing a data item describing the release. Column **1020** contains an identifying label that uniquely identifies a release. Column **1030** contains the date on which the next interim build will take place. Column **1040** contains the date on which the next throttle build will take place. Column **1050** contains the date by which software fixing the bug must be implemented in order to be included in the maintenance release build. Column **1060** contains the maintenance release date when the software release will be generally available to customers and others outside of the engineering organization.

[0052] **FIG. 11** is a flowchart for collecting data based on a Maintenance Release Identifier as done by component **225** of **FIG. 2**. First step **1115** preferably presents to the user a drop down box containing a list of major release identifiers, from which the user selects a major release identifier. Step **1125** parses the user's input into an input data structure. Step **1130** reads from the software release database the schedule for software releases. Next, step **1135** stores relevant data about each release in the data structure describing the software release. Step **1140** then examines each data structure describing the software release looking for a match based on the major release identifier. Each time a match is found, relevant data is taken from the data structure describing the software release and placed in a schedule display data structure, preferably a hash table. The method concludes in step **1150** where the schedule display data structure is used to dynamically generate HTML for displaying a web page containing a data collection from the release schedule database.

[0053] **FIG. 12** shows a display of the data collected by the process of **FIG. 11**. Schedule display screen **1200** includes the query component selection index **310** and a schedule table **1210** with each row representing a maintenance release within the major release identified by the release identifier obtained in step **1115** of **FIG. 11**. Column **1220** contains the label identifying the maintenance release. Column **1230** contains the date when the release was or will be first available for downloading to customers. Column **1240** contains the date when the release will be first included with hardware or distribution media produced during the manufacturing process for shipment to customers.

[0054] **FIG. 13** shows the initial screen **1300** of component Week **230** of **FIG. 2**, a display which allows a user to select a particular week of a year. Input to this component is a date corresponding to a week for which the user desires to obtain release information. Screen **1300** preferably comprises the query component selection index **310**, and a weekly calendar **1310** which contains a year drop down box **1320** and a month drop down box **1325** which, when selected, present a list of years and months within a year. The calendar also contains one day button **1330** for each Monday in the selected month. A user selects a particular week by choosing a year and month from drop down boxes **1320** and **1325**, and by pressing the day button for the Monday of the desired week. The selected date is then input to the method described in **FIG. 14**.

[0055] FIG. 14 is a flowchart for collecting data based on an input of a particular week as done by Week 230 component of FIG. 2. First, step 1410 presents to the user a calendar based input screen of FIG. 13 similar to the calendar described with reference to FIG. 9 but only allowing selection of Mondays. Next, in step 1415, the system parses the date selected by the user. Step 1420 reads from the software release database the schedule for software releases. Next, step 1425 stores relevant data about each software release in the data structure describing the software release. Step 1430 builds a list of software releases.

[0056] Step 1435 of FIG. 14 begins a loop that iterates over each software release in the list built in step 1430 by determining if any unprocessed releases remain in the list. If at least one release remains in the list, then step 1440 examines each data structure describing the software release to determine if the software release has a build date during the week starting on the Monday input in step 1410. If the software release does not have such a date, the method proceeds to step 1447. If it does then step 1445 retrieves relevant data from the software release data structure and stores it in a release display data structure, preferably a hash table. Next, step 1447 obtains the next release, if any, in the list.

[0057] When all software releases in the list have been processed, step 1435 directs the method to step 1450 which uses the release display data structure dynamically to generate HTML for a web page that displays a table of software release data like FIG. 15.

[0058] FIG. 15 shows a display of the data collected by the process of FIG. 14. Screen 1500 includes the query component selection index 310, calendar 1310, and a weekly release schedule table 1510 with each row representing an individual release and each column containing a data item describing the release. Columns 1520, 1525 and 1530 may contain dates either in the past or the future depending on the date input by the user. Column 1515 contains an identifying label that uniquely identifies a release. Column 1520 contains a scheduled date for the interim build. If no interim build is scheduled for the specified week, column 1520 will be blank. If the user specifies a past date, the date in column 1520 will show the date that the interim build occurred. If the user specifies a future date, column 1520 will show the date the interim build is currently scheduled to occur. Column 1525 contains a date scheduled for a throttle build. Like column 1520, if no throttle build is scheduled for the specified week, the column entry will be blank. If the date in column 1525 is in the past, it represents the date within the week specified by the user that the throttle build occurred. Otherwise, the date in column 1525 represents the date within the specified week that the throttle build is to occur. Column 1530 contains a date scheduled for a renumber build, which, if no renumber build is scheduled for the specified week, will be a blank entry. If the date in column 1530 is in the past, it represents the date within the specified week that the renumber build occurred. Otherwise, the date in column 1530 represents the date within the specified week that the renumber build is to occur.

[0059] FIG. 16 shows the initial screen of FIG. 2 component 235, a release selection screen 1600 for allowing the selection of a particular release number. Screen 1600 comprises the release query component selection index 1610 as

expanded by the method described with reference to FIG. 5, and interim build table 1620. Release query component selection index 1610 contains a list of major release identifiers. After the user selects one of the major release identifiers, the system displays an interim build table 1620 organized left to right by columns 1630. Each column represents a time series of interim build identifiers within the major release selected by the user. The bottom entry in each column represents a maintenance release identifier. Each entry in a column is preferably a selectable hyperlink that, when selected, presents information to the user about the bugs fixed in that release.

[0060] FIG. 17 is a flowchart for collecting data based on the selection of a particular release identifier as done by FIG. 2 Integrated Bug List 235. The method starts with step 1710 when a user selects a major release identifier from the list of available major releases. Next, step 1715 uses HTML to dynamically generate an interim build table 1620 (FIG. 16) and displays it to the user. In step 1720, the user selects one of the entries representing a particular release in the interim build table, which causes step 1725 to parse the selection. Next, step 1730 uses the input from the selection in step 1725 as a key to query a release information database and find related information about the release. Finally, step 1735 uses HTML to dynamically generate a table of a selected subset of the information returned by the query, and displays a web page.

[0061] FIG. 18 shows a display of the data collected by the process of FIG. 17. Integrated bug display 1800 comprises release query component selection index 1610 and interim build table 1620 (FIG. 16), and an integrated bug table 1810 with each row representing a particular release. Column 1820 contains an interim or maintenance release identifier which uniquely identifies a particular interim or maintenance release and preferably also contains in parenthesis a number representing the number of bugs fixed in the particular release. Column 1830 contains a list of bug identifiers that uniquely identify particular bugs that have been fixed in the release. Column 1840 contains a severity level corresponding to the bug with the identifier in column 1830. Column 1850 contains a brief description of the bug identified by the bug identifier in column 1830.

[0062] While the present invention has been described with reference to a preferred embodiment, those skilled in the art will recognize that various modifications may be made. Variations upon and modifications to the preferred embodiment are provided by the present invention, which is limited only by the following claims.

What is claimed is:

1. A method for a computer system to obtain software release information, comprising the steps of:

- obtaining a set of defect data from a database having software defect information;
- obtaining a set of schedule data from a database having software scheduling information;
- obtaining a set of release data from a database having software release information;
- relating data from at least two of said sets to create an organized data set; and
- displaying the organized data set on an output device.

2. The method of claim 1 wherein the step of displaying includes dynamically generating a web page exhibiting the organized data set.

3. The method of claim 1 wherein said step of relating includes the steps of:

obtaining a first bug identifier from the set of defect data;

obtaining a second bug identifier and a first release identifier from the set of release data;

obtaining a second release identifier from the set of schedule data; and

identifying the defect data and the release data in which the first bug identifier equals the second bug identifier and the release data and the schedule data where the first release identifier equals the second release identifier.

4. The method of claim 1 wherein the step of displaying includes the steps of:

assigning a unique color to a first value;

deriving a second value from the organized data set; and

displaying an indicator having the unique color when the first value equals the second value.

5. The method of claim 1 wherein said output device is a remote display connected to a network.

6. The method of claim 1 wherein the step of obtaining a set of defect data filters the set of defect data by a defect identifier.

7. The method of claim 1 wherein the step of obtaining a set of schedule data filters the set of schedule data according to a date.

8. The method of claim 1 wherein the step of obtaining a set of release data filters the set of release data by a release identifier.

9. A system for obtaining software release information, comprising:

means for obtaining a set of defect data from a database having software defect information;

means for obtaining a set of schedule data from a database having software scheduling information;

means for obtaining a set of release data from a database having software release information;

means for relating data from at least two of said data sets to create an organized data set; and

means for displaying the organized data set on an output device.

10. The system of claim 9 wherein the means for displaying includes means for dynamically generating a web page exhibiting the organized data set.

11. The system of claim 9 wherein said means for relating includes:

means for obtaining a first bug identifier from the set of defect data;

means for obtaining a second bug identifier and a first release identifier from the set of release data;

means for obtaining a second release identifier from the set of schedule data; and

means for identifying the defect data and the release data in which the first bug identifier equals the second bug identifier and the release data and the schedule data where the first release identifier equals the second release identifier.

12. The system of claim 9 wherein the means for displaying includes:

means for assigning a unique color to a first value;

means for deriving a second value from the organized data set; and

means for displaying an indicator having the unique color when the first value equals the second value.

13. The system of claim 9 wherein said output device is a remote display connected to a network.

14. The system of claim 9 wherein the means for obtaining a set of defect data filters the set of defect data by a defect identifier.

15. The system of claim 9 wherein the means for obtaining a set of schedule data filters the set of schedule data according to a date.

16. The system of claim 9 wherein the means for obtaining a set of release data filters the set of release data by a release identifier.

17. A computer-useable medium embodying computer program code for causing a computer to obtain software release information by performing the steps of:

obtaining a set of defect data from a database having software defect information;

obtaining a set of schedule data from a database having software scheduling information;

obtaining a set of release data from a database having software release information;

relating data from at least two of said sets to create an organized data set; and

displaying the organized data set on an output device.

18. The computer-useable medium of claim 17 wherein said step of displaying includes dynamically generating a web page exhibiting the organized data set.

19. The computer-useable medium of claim 17 wherein said step of relating includes the steps of:

obtaining a first bug identifier from the set of defect data;

obtaining a second bug identifier and a first release identifier from the set of release data;

obtaining a second release identifier from the set of schedule data; and

identifying the defect data and the release data in which the first bug identifier equals the second bug identifier and the release data and the schedule data where the first release identifier equals the second release identifier.

20. The computer-useable medium of claim 17 wherein the step of displaying includes the steps of:

assigning a unique color to a first value;

deriving a second value from the organized data set; and

displaying an indicator having the unique color when the first value equals the second value.

21. The computer-useable medium of claim 17 wherein said output device is a remote display connected to a network.

22. The computer-useable medium of claim 17 wherein the step of obtaining a set of defect data filters the set of defect data by a defect identifier.

23. The computer-useable medium of claim 17 wherein the step of obtaining a set of schedule data filters the set of schedule data according to a date.

24. The computer-useable medium of claim 17 wherein the step of obtaining a set of release data filters the set of release data by a release identifier.

25. A system for obtaining software release information, comprising:

a memory storing computer instructions which cause a processing unit to

obtain a set of defect data from a database having software defect information,

obtain a set of schedule data from a database having software scheduling information,

obtain a set of release data from a database having software release information,

relate data from at least two of said sets to create an organized data set, and

display the organized data set on an output device; and

a processing unit coupled to the internal memory for executing said instructions.

26. The system of claim 25 wherein said instructions which cause a processing unit to display the organized data set further cause said processing unit to dynamically generate a web page exhibiting the organized data set.

27. The system of claim 25 wherein said instructions which cause a processing unit to relate data from at least two of said sets further cause said processing unit to

obtain a first bug identifier from the set of defect data,

obtain a second bug identifier and a first release identifier from the set of release data,

obtain a second release identifier from the set of schedule data, and

identify the defect data and the release data in which the first bug identifier equals the second bug identifier and the release data and the schedule data where the first release identifier equals the second release identifier.

28. The system of claim 25 wherein said instructions which cause a processing unit to display the organized data set further cause said processing unit to

assign a unique color to a first value,

derive a second value from the organized data set, and

display an indicator having the unique color assigned to the first value when the first value equals the second value.

29. The system of claim 25 wherein said output device is a remote display connected to a network.

30. The system of claim 25 wherein said instructions which cause a processing unit to obtain a set of defect data further cause said processing unit to filter the set of defect data by a defect identifier.

31. The system of claim 25 wherein said instructions which cause a processing unit to obtain a set of schedule data further cause said processing unit to filter the set of schedule data according to a date.

32. The system of claim 25 wherein said instructions which cause a processing unit to obtain a set of release data further cause said processing unit to filter the set of release data by a release identifier.

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